INTEREST RATE RISK MANAGEMENT OF PUBLICLY FUNDED UTILITY COMPANIES IN HONG KONG

by

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ABSTRACT

Risk management has been undergoing rapid development in the past few decades. Some of the techniques are quickly absorbed by financial institutions in managing their different kinds of risk exposure. Basically, it involves risk identification, risk measurement, risk handling and administration.

In the former two steps, Gap Analysis, Duration Analysis and Simulation Analysis are commonly used. However, there are some imperfections in the three methods.

As to the risk handling, several tools are developed for effective interest rate risk management. They are interest rate swaps, interest rate futures, interest rate options, forward rate agreements, interest rate cap, interest rate floor, interest rate collar and interest rate swaptions.

In the project, the author finds that given the difference in corporation's operations and financial policy, the two publicly funded corporations studied behave differently in the management of interest rate risk. They tend to use swaps as their tools of management. This may be explained by their conservative approach and tight control.

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CHAPTER I

INTRODUCTION

SCOPE

Risk management is an activity undergoing tremendous growth in the past decade. Initially, it was mainly an activity of the insurance or insurance-related industry. When applied in the insurance field, its scope primarily involves the protection or defence of an organisation against pure or static risks. Pure risk refers the probability of gain or loss. Therefore one function of risk management is to identify and evaluate such risk and to create and establish methods or systems to cope with it to the optimal financial advantage of the organisation. In a sentence, risk management strategy ensures that the organisation is not destabilised by the occurrence of such loss-producing events.

Usually, risk management involves several steps. They are: a) risk identification, b) risk measurement, and c) risk handling and administration. As required skills and technology have become more sophisticated, the same principles are applied throughout the financial world especially with firms which are involved with billions of dollars worth of assets. Usually, risk management is categorised into currency and interest rate risk management.

Interest Rate Risk Management

In the financial world, many publications have focused on the side of banks and financial institutions. However, there are very few articles that focuses on other types of business. In this paper, the author will like to examine interest rate risk management as practised by two public utilities in Hong Kong (M.T.R. and K.C.R.). Mainly, this serves as an exploratory exercise to broaden the readers' scope to include these particular companies. The reason for choosing the two companies is that they are both heavily debt-financed and have strong expertise in the field of financial management. Interest rate risk management as developed by the financial institutions will be reviewed first. Finally, an appraisal of risk management techniques used by public utilities companies is provided.

CHAPTER II

METHODOLOGY

The project is divided into two parts. The first part forms the theoretical section of the project. The data and information mainly comes from books and journals. However, interviews will be used to supplement the data whenever it is appropriate.

For the second portion, annual reports of the corporations are mainly used. However, interviews with treasury department staff are arranged in order to clarify and discuss the issues involved in the project. Finally, active advice from financial institutions and supervisor are sought after whenever appropriate.

CHAPTER III

WHAT IS RISK MANAGEMENT ?

Risk management primarily involves the protection or defence of an organisation against pure or static risks, as distinct from business, speculative, or entrepreneurial risks. Business risks comprise the trading and micro-economic hazards associated with production and with marketing in its widest sense and characteristically hold out the prospect of gain or profit as well as of loss. Pure risk on the other hand holds only the prospect of loss and it is the function of risk management to identify and evaluate such risk and to create and establish methods or systems to cope with it to the optimal financial advantage of the organisation. Risk management is closely linked with a wide range of accepted management disciplines such as corporate planning, quantitative methods, organisation development and financial modelling. It is a part of up-to-date effective management practice.

CHAPTER IV

WHAT IS INTEREST RATE RISK MANAGEMENT ?

Interest rate risk appears when interest rate movements create uncertainty regarding the future cash flows emanating from or relating to the financial assets and liabilities of a corporation.

These cash flows can relate to the current interest payments on the financial assets and liabilities where the amount of interest being exchanged is determined by the interest rate basis being applied on the principal. The cash flow implications can also relate to the cash and liquidation value of long-term financial assets and liabilities.

Interest rate risk management seeks to minimize the damage suffered from rising rates while leaving room for adjustment if interest rate stay the same or move lower.

Historically, some of the interest rate risk instruments have been developed with a focus on the corporation's liabilities whereas other instruments have

tended to be associated with the investor's asset side.

CHAPTER V

IMPORTANCE OF INTEREST RATE RISK MANAGEMENT

Interest rate risk occurs when a business has assets and liabilities for which market value, earning power and cost vary in relation to movements in interest rates. Many companies find their profits unnecessarily eroded by unexpected movements in interest rates. Such profit exposure is seen at many types of businesses. Cash flow exposures affected by changes in the interest rate level arises because the interest rate basis of assets and liabilities differs.

When a corporation places a one-month short-term deposit in the money market at the overnight rate with a funding obtained through the discount issuance of six-month notes, the corporation will incur a cash flow squeeze when the interest rate level falls, but will experience a cash flow gain if the interest rate level increases.

Table 1: Interest Rate Mismatch

(A)	Assets : Floating rate	Liabilities : Fixed rate
(B)	Assets : Fixed rate	Liabilities : Floating rate

Source: Currency and Interest Rate Hedging: A User's Guide to Options, Futures, Swaps and Forward Contracts. New York Institute of Finance, 1987

The effect of interest rate movement will be more prominent when a company's net income is mostly derived (say over 80%) from rate-related assets and liabilities. Given the high volatility of interest rates for the past decades (Figure 1), poor risk management will mean disaster for a corporation.

For instance, the problems of the U.S. savings and loan (S&L) industry in the 1970s and 1980s may be attributed to the absence of risk managements. In the 1970s, S&Ls looked like money machines. With an upward-sloping and stable yield curve, S&Ls profited by taking in

short-term passbook deposits and making long-term, fixed-rate mortgage loans. In the 1980s, S&Ls changed from money machines to money pits. Those same long-term, low-rate loans to homeowners were now being financed with high-rate and volatile short-term funds.

The same situation applies in other business. Consider the following selected balance sheet and income statement items of a hypothetical manufacturing company :

Total assets: $18 million
Adjustable-rate loans: $10 million
Interest expense on adjustable
loans: $1.1 million

	(in million)
Gross revenue	$5.0
Expenses	4.5
Net income	$ .5

The figures show that if rates rise by just 100 basis points, the income will fall by $100,000, a movement of 20%. (Total adjustable-rate loans of $10 million x 1% =$100,000; $100,000/$500,000 = 20%).

CHAPTER VI

TECHNIQUES USED IN INTEREST RATE RISK MANAGEMENT

Basically, there are three types of techniques being employed in managing interest rate risk. Gap Analysis, Duration and Simulation are used to register the risk exposure and help to implement limits on risks exposures to be faced at one time.

Gap Analysis

Gap is the dollar amount of mismatch of assets and liabilities that reprice over a specified time horizon. The mismatches are computed for a series of time horizons and cumulated from daily to the longest maturities a company holds.

Interest rate risk exposure is typically registered by listing the assets and liabilities according to repricing dates. This is often referred to as the interest maturity ladder (Table 2).

TABLE 2: Repricing Profile of Assets and Liabilities

(US$; 000s) - a hypothetical example

Maturity	Assets	Liabilities	Interest rate gap	Cumulative gap
< 1 wk	19,500	20,250	- 750	-750
1-3 mths	13,000	13,500	- 500	-1,250
3-12 mths	11,500	11,750	- 250	-1,500
1-3 yrs	8,750	7,250	1,500	0
3-5 yrs	6,250	5,000	1,250	1,250
> 5 yrs	5,750	7,000	-1,250	0
Total	64,750	64,750		

Analysis of gap positions is widely practised; oftentimes, gap reports are a part of presentations to boards of directors. For a specified time horizon, where more liabilities reprice than assets, a negative gap developed. Gap theory says that the corporation's income for that segment of its asset/liability structure will improve in a falling interest rate environment. Where more

assets reprice than liabilities i.e. positive gap, the theory says that the corporation's income for that segment of its asset/liability structure will improve in a rising interest rate environment.

Limitations

For gap theory to work well in practice requires accurate interest rate forecasts and near-perfect matching of asset and liability cash flows within each specified time horizon. However, income and risk expectations can easily go awry where the repricing of the assets and liabilities within a specified time horizon are bunched at opposite ends of the time period. This kind of static analysis causes lots of problems. For example, this type of analysis does not capture the effect of changes in the relative spreads of different interest rates. A portfolio that seems to be matched for the one-month period may still experience large changes in net interest income if rates shift. This could happen if the rates on certain assets or liabilities experienced a larger change than other assets or liabilities with the same maturity.

Another drawback is that if the time periods included in the maturity categories are too wide, they may misrepresent the effects of the repricing of assets and liabilities within a given category. For instance, assume a category has a zero gap and the assets reprice early in the given period and the liabilities reprice late in that period. A decrease in interest rates could then result in a drop in net interest income.

Furthermore, gap theory gives little specific information on the amount by which net interest income and the net present value of the corporation's equity (the present value of the cash inflows minus the present value of the cash outflows) will change for specific changes in interest rates.

Duration Analysis

Duration analysis focuses on the present value of the corporation's assets and their sensitivity to changes in interest rates. Duration is an index number that indicates the sensitivity of the value of an asset to changes in the rate of interest. It is a weighted average of the cash

flows of an asset where the weights are the periods when each of the cash flows is received. It provides a number that indicates how much the instrument's price will change when interest rates change.

Figure 2: Duration Formula

$$D = \frac{\text{Sum}^{n}_{t=1}\ t \times \frac{C_t}{(1+r)t}}{P}$$

Where :

t = time period

n = number of periods to final maturity

C_t = cash flow in period t

r = market yield on the security

P = market price of the security

Correctly done, each cash flow should be discounted by the spot rate associated with the period when the cash flow is received.

Each cash flow can be looked at as a zero coupon bond and the spot rate that would be used to discount such a zero coupon bond is used to discount the indicated cash flow of the asset for that period.

Limitation

Duration analysis will be of limited use to corporations in managing interest rate risk if the maturities of the corporations' assets and liabilities are short. Also, it works best during periods of stability in interest rates, but relatively poorly when it is most needed, namely, during periods of high volatility in interest rates. And for many of the assets and liabilities, the cash flow will be uncertain. In addition, the maturity or repricing of some of the assets and liabilities will be difficult to determine. Another drawback is that duration focuses on the value of a corporation's assets and equity rather than net interest income.

Simulation Analysis

Today, simulation analysis usually refers to the automated simulation analysis, thanks to the rapid development in computer technology. It uses a mathematical computer model on the rate-sensitive portion of business to simulate the effect on earnings of different risk-control strategies. The objective is to find the best solution to a company's interest rate risk problem. A typical simulation would perform the following two analyses:

1. Embedded risk. This is the interest rate risk present in the balance sheet before attempting any control strategies. It is computed by assuming that the balance sheet remains constant while an earnings simulation is run over varying interest rate scenarios.

   Embedded interest rate risk defines the starting point for implementation of control procedures. Boundaries defined by embedded risk will be established. The lines labelled "embedded potential" and "embedded downside" form the

limits of embedded risk. The goal of risk-control strategies is to reduce the size of this embedded risk wedge.

2. Identification of possible strategies. Once embedded risk is identified, the effect of specific corrective strategies is simulated. During this phase, the utility of a computer model becomes apparent, allowing for the quick and efficient evaluation of various strategies. Once the embedded risk and possible alternative strategies are identified, management begins to formulate a specific solution to its interest risk problem.

Limitations

Though simulation models have advantage over gap analysis by giving dynamic view of interest-rate risk, they still have some problems. They may require a projected yield curve for effective solution. However, this can be very difficult. If the projections are off, then the simulations will be less effective.

CHAPTER VII

TREASURY TOOLS AVAILABLE

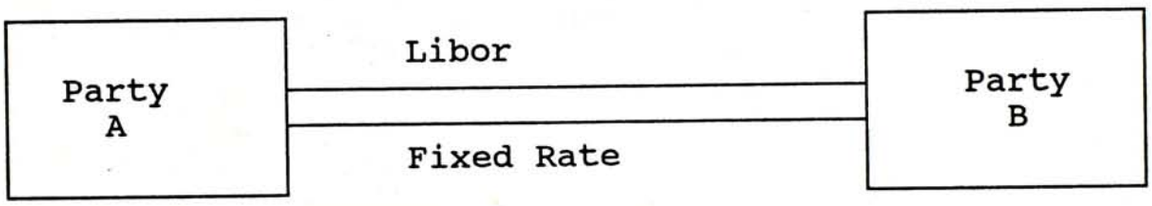
Interest Rate Swap

A swap is a financial transaction in which two parties agree to exchange streams of payments over time. The two main types are Currency Swaps and Interest Rate Swaps. In an Interest Rate Swap no actual principal is exchanged either initially or at maturity, but interest payment streams of differing character are exchanged according to predetermined rules and based on an underlying Notional Principal amount. A simple interest rate swap is characterised as an agreement between two parties in which one agrees to pay an amount equal to interest which would accrue on a given principal amount at one type of interest rate and the other agrees to pay an amount equal to interest which would accrue thereon using a different type of rate. The classic swap (Figure 3), uses Libor as from time to time in effect throughout the agreement term against a fixed rate of interest for the term. Typically, payment dates for both parties are the same, in which case the payments are netted against each other, with only the

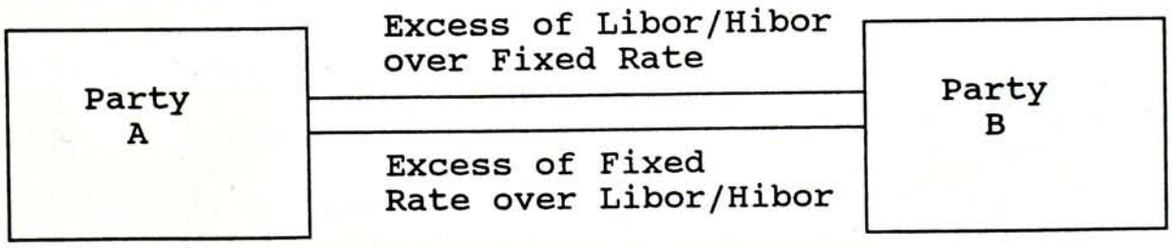
excess of the larger amount actually being paid. Three main types exist. They are : Coupon Swaps (or fixed rate to floating rate swaps), Basis Swaps (from floating rate against one reference rate to floating rate with another reference rate) and Cross-Currency Interest Rate Swaps (swaps of fixed rate flows in one currency to floating rate flows in another).

Figure 3 Simple Interest Rate Swap

A Basic transaction



B Actual transaction, netted basis



In a coupon swap, one party pays a stream of fixed rate interest payments and receives a stream of floating rate payments, both denominated in the same currency. The counterparty receives fixed and pays floating.

In a basis swap, the interest payments exchanged are calculated from two different floating rate indices, e.g. three-month dollar LIBOR against the US Commercial-paper composite rate.

A cross-currency interest rate swap involves the exchange of payments in different currencies and also on different interest rate bases, such as floating rate to fixed rate. This type of swap involves the exchange of non-dollar fixed rate interest payments for dollar floating rate interest payments.

Most coupon swaps are denominated in dollars, largely because of the important role of the dollar in world finance. Also, there are many willing payers of fixed dollar interest rates, and open dollar swap positions can be easily hedged in the broad and deep dollar asset markets.

The price on a non-dollar interest rate swap of a given maturity is quoted as an absolute fixed rate (for example, 10 3/4 per cent.) against a floating rate index, quoted flat (with no margin over or under the fixed rate index against the floating rate index flat; for example, an intermediary might quote the price on a seven-year Treasury-LIBOR swap to a fixed rate payer as "the seven-year Treasury rate plus 60 basis points versus six-month LIBOR". Under market convention, this is an "offer" swap price, i.e. the price at which the market is willing to sell fixed rate exposure. The spread quoted to a floating rate payer is the "bid" swap price.

Two major kinds of risk exist: price risk and credit risk. Price risk arises because interest rates or exchange rates can change from the date on which the swap is arranged. Credit risk arises because a counterparty may fail to perform and that event may expose a swap participant to an unexpected and unintended mismatch.

The fixed and floating-rate funding sources underlying interest rate swaps are summarized below (note that the list is by no means exhaustive).

Fixed-rate Sources:

- Eurobonds
- Public Bonds
- Private Placements
- Export Credits
- Certificates of Deposit

Floating-rate sources:

- Floating-rate Notes
- Bank Loans
- Commercial Paper
- Euronotes
- Certificates of Deposit

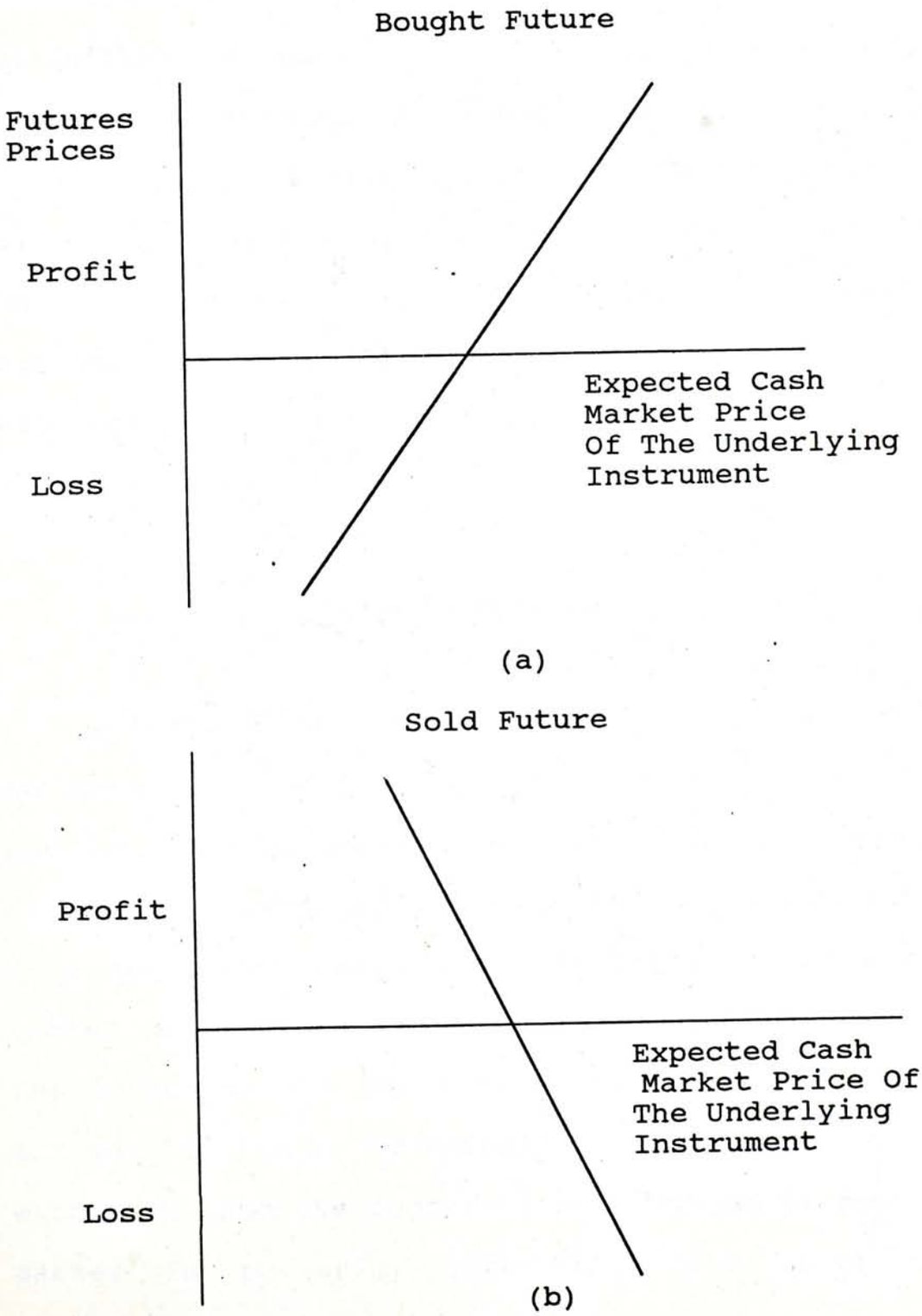
Futures Markets

Futures contracts are standardized agreements to trade (buy and sell) commodities in the future. Their roots lie in the mid-American commodity exchange, but they were later developed to incorporate financial commitments as their base commodity. Financial futures contracts in principle cover three types: foreign exchange contracts, interest rate contracts and index contracts. Take The Three-Month

Hong Kong Interbank Offered Rate (HIBOR) Futures Contract as an example. It operates by providing a standardized contract basis for trading commodities or financial instruments for future delivery on margin. Contracts are immediately tradeable without secondary gain or loss to buyers and sellers.

The pricing of short-term financial futures contracts (contracts where the maturity of the underlying instrument is less one year), is done on an index basis. That is, the par value of the contract (100.00) is subtracted by the annual discount rate of the instrument. If the annual discount rate of the three-month Euromark deposit for December delivery is 7.25%, the corresponding futures will be priced at 100.00-7.25=92.75. The basis applies also to the long-term financial futures contracts (contracts with maturity greater than 1 year).

Figure 4: Profit and Loss Profile of A Futures Contract



The financial futures market can be used in different situations to manage the interest rate exposure of a particular corporation. The underlying principle behind this is that the sale of interest rate futures contracts will produce a capital gain which will counterbalance the consequences of a potential rise in interest rates. Similarly, a purchase of interest rate futures contracts will produce a gain which offsets the potential loss from a fall in interest rates.

Forward Rate Agreements

A forward rate agreement (FRA) is closely analogous to an interest rate future. It is a contract in which two parties agree on the interest rate to be paid on a notional deposit of specified maturity at a specific future time (the settlement date). The contract period for FRAs is quoted as, for example, "six against nine months", meaning the interest rate for a three-month period commencing in six months' time. Principal amounts are agreed but never exchanged, and the contracts are settled in cash. The FRA market is primarily interbank, with about half the

contracts arranged through brokers. FRAs offer the features of simplicity, flexibility, absence of margins and the possibility of an instrument tailored exactly to a bank's or a customer's interest rate mismatch. FRAs give rise to a replacement cost risks; if the counterparty to a FRA fails, a bank is at risk to the extent that it expects to receive a payment from the counterparty, given the current level of interest rates. The risk of loss depends on both the adverse movement of interest rates and the default of the counterparty.

The advantage of the FRA is that it only entails the exchange of the interest rate differential between the agreed future rate and the actual market development of the interest rate basis or reference rate. Thus FRAs can be considered off-balance sheet instruments.

However, as there is no central marketplace/exchange, therefore, liquidation is only possible if there is an agreement to cancel/reverse the transaction. Moreover, the spread built into the rates in practice is higher than that of the financial futures market.

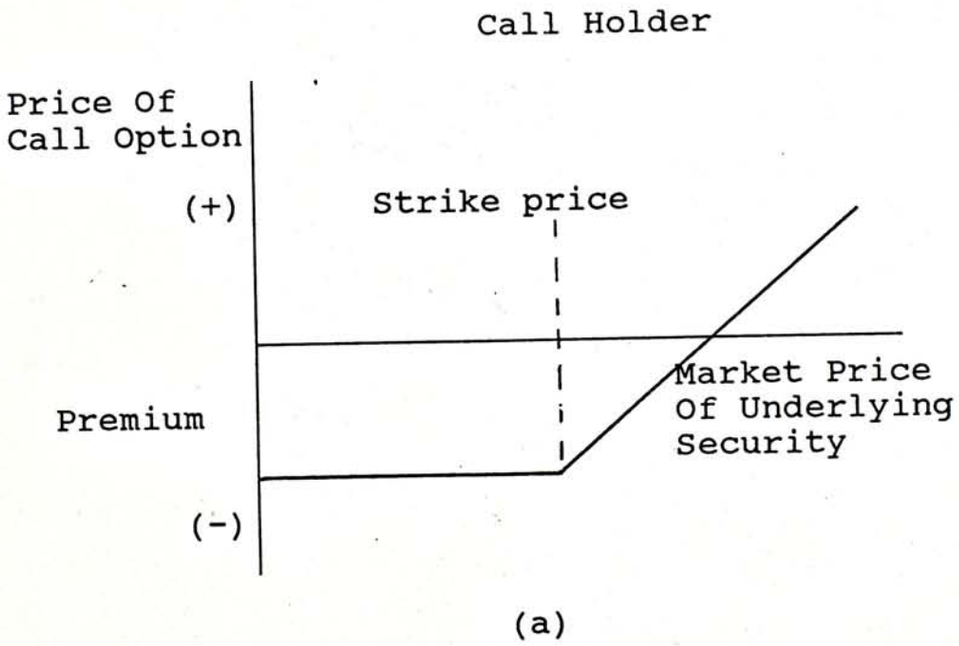
Options Markets

An option is a contract conveying the rights, but not the obligation, to buy (Call) or sell (Put) a specified financial instrument (the Underlying) at a fixed price (Exercise or Strike Price) before or at a certain future date. There are two parties to an option contract: the option seller (Writer or Guarantor) and the option purchaser (Buyer or Holder) purchases from the writer a commitment that the option writer will stand ready to sell or purchase a specified amount of the underlying instrument on demand. The option buyer's cost for this right (Premium or Option Price) is paid to the option writer, and can be expressed in a variety of ways, e.g. as a percentage per unit of the underlying, or in cents (or other currency units) per unit of the underlying.

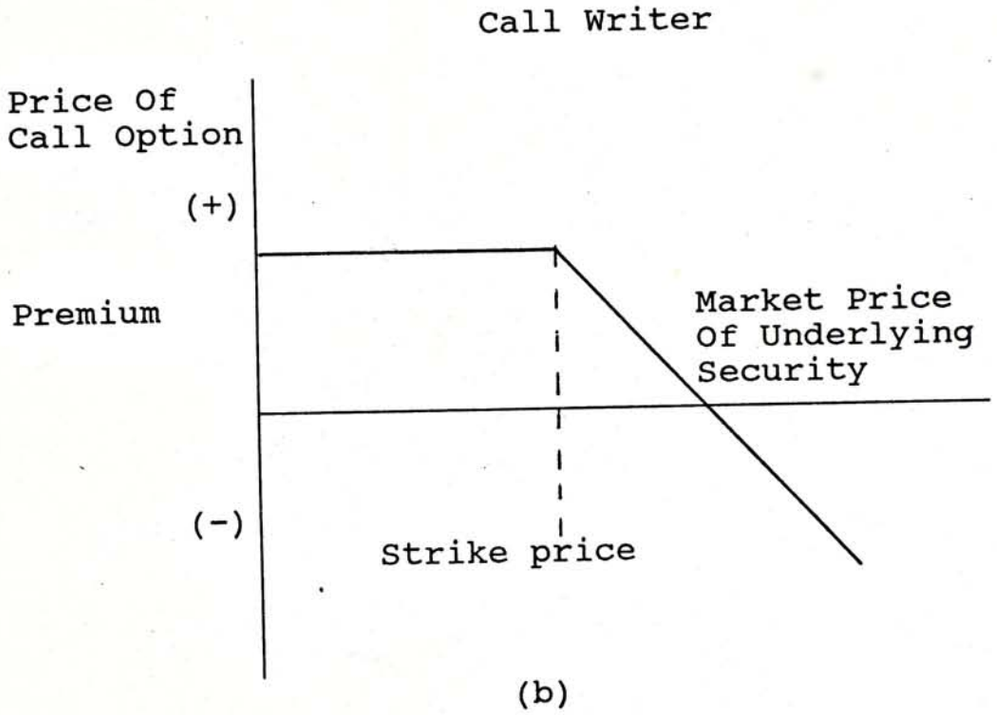
The option extends or is "alive" until a set Expiration or Maturity Date. If the option contains a provision to the effect that it can be exercised at any time (Exercise Date) between the date of writing and the expiration date, it is termed an American Option; if it can be exercised only at maturity, it is termed a European

Option. On the expiration date, the option owner can exercise his right to buy or sell the underlying, can let the contract expire, or, under certain conditions, can sell the option contract in the market.

Figure 5: Profit and Loss Profile of A Call Option

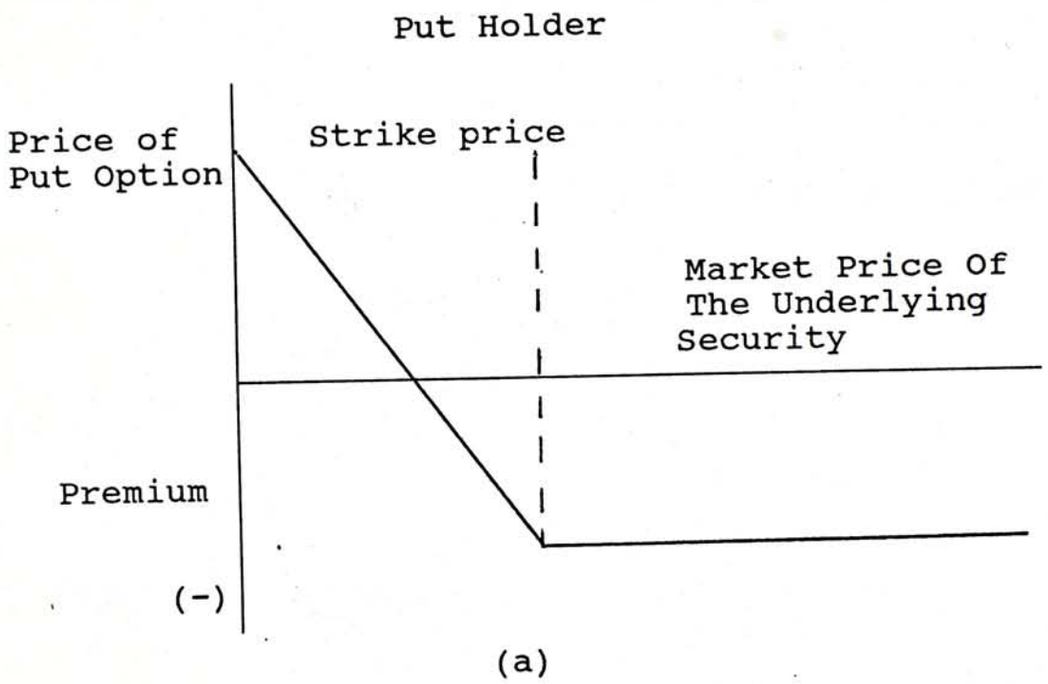


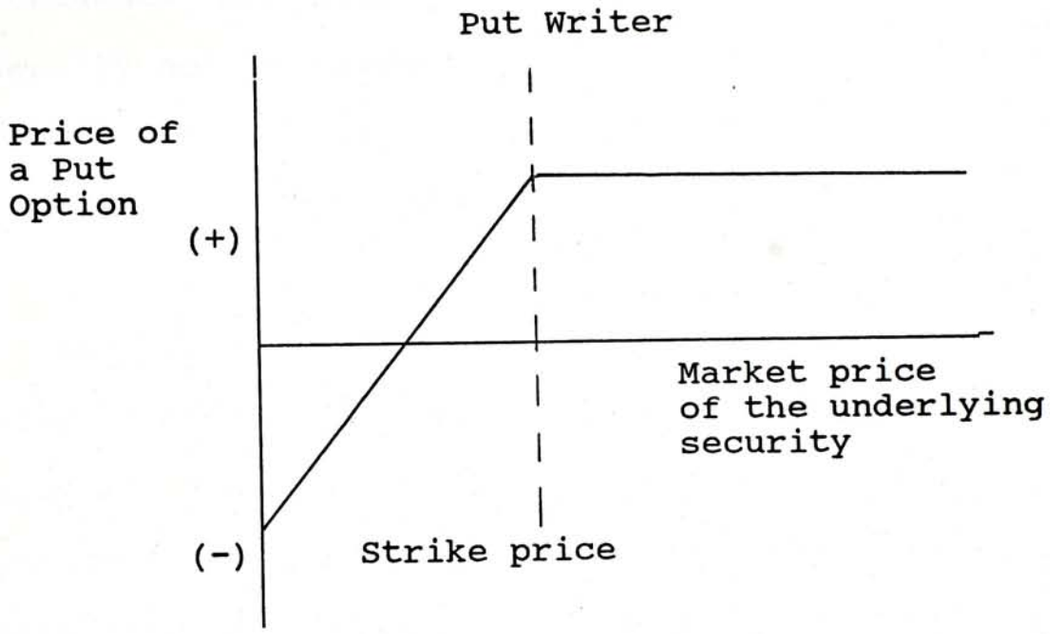
(a)


Call Writer
Price Of
Call Option
(+)
Premium
Market Price
Of Underlying
Security
(-)
Strike price

(b)

Figure 6: Profit and Loss Profile of A Put Option





(b)

Exchange traded versus Over the counter options

Options are purchased and traded either on an organised exchange or in the over-the -counter (OTC) market. Exchange-traded options are standardized contracts on specified underlying instruments, in multiples of standard amounts, with predetermined exercise prices, set according to predefined formulae and with standard maturities. OTC option specifications are generally negotiated as to the underlying instrument, amount, exercise price, exercise rights and maturity. Some OTC options are written to correspond to exchange-traded

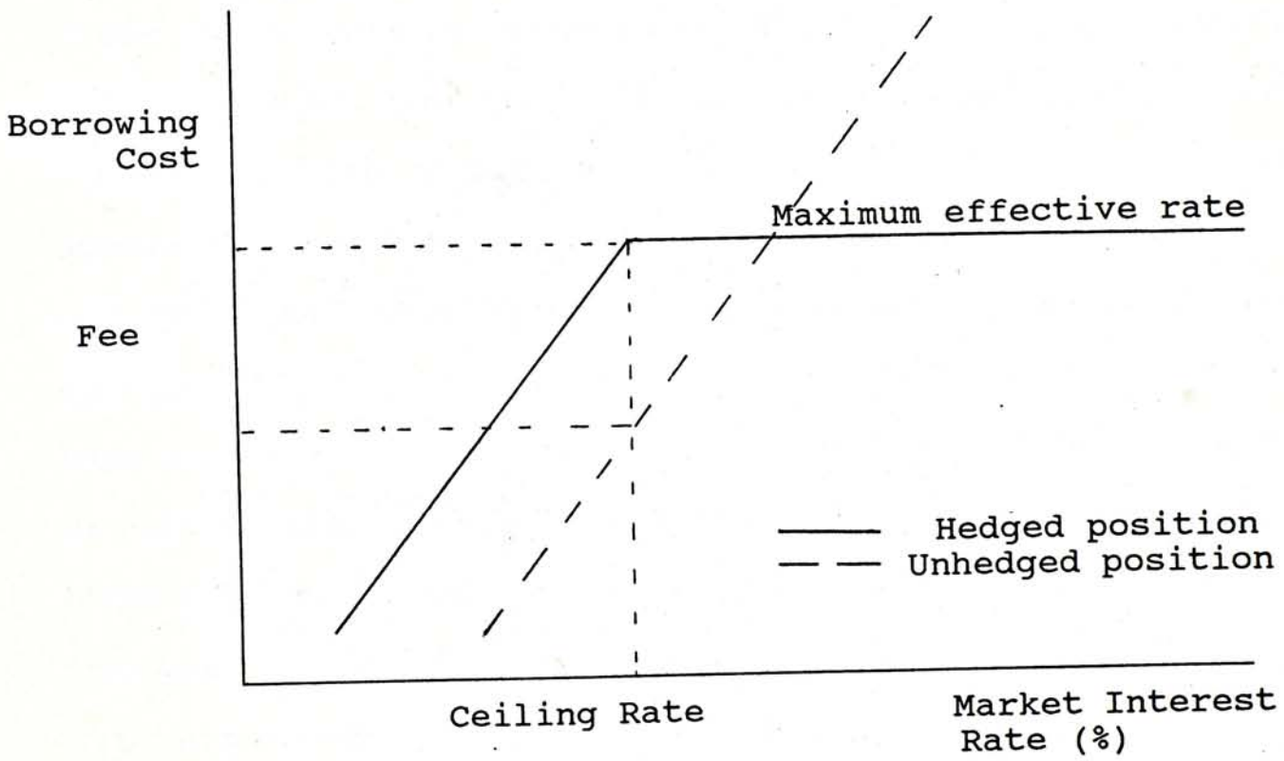
instruments in exercise price and expiration, although generally not in amount.

Interest Rate Cap

An interest rate cap is an agreement between the seller or provider of the cap and the borrower to limit the borrower's floating interest rate to a specified level for a period of time. The floating rate borrower selects the appropriate rate index of his debt (e.g. prime, commercial, or LIBOR paper) a period (e.g. 6 months, 18 months, 2 years, 5 years or 10 years), and level of protection desired (e.g. 8 percent, 11 percent, or 14 percent). The cap provider then assures the buyer, for a fee, that his interest rate will not exceed the specified cap rate during the term of the agreement. If the market rates exceed the cap rate, the cap provider will make payments to the buyer to bring his effective rate back to cap level. When market rates are below the cap, no payments are made and the borrower pays market rates.

The buyer of a cap enjoys a fixed rate when market rates are above the cap and floating rates when market rates are below the cap.

Figure 7: A Interest Rate Cap Agreement

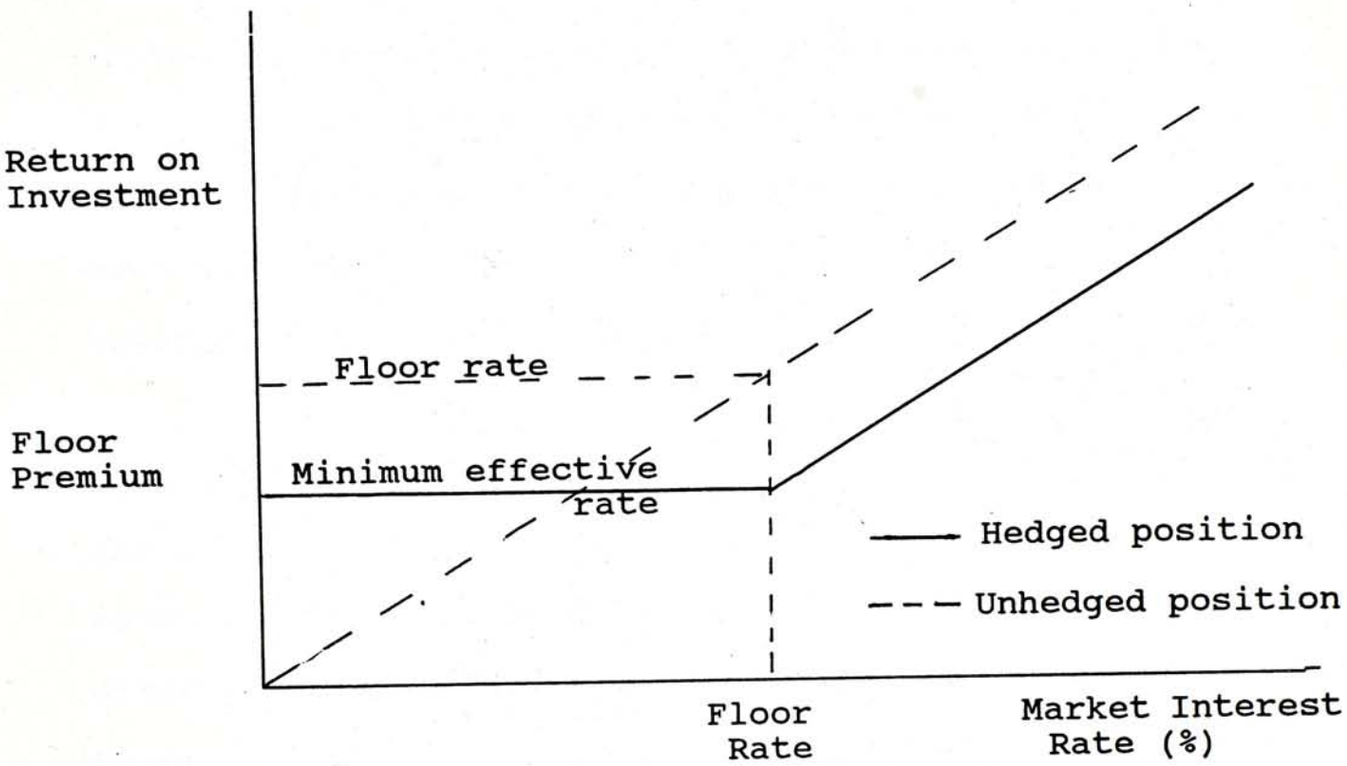


Interest Rate Floor

Interest rate floor is somewhat the inverse of a cap. It is an agreement between the seller and buyer of the floor that sets a minimum level to which a floating interest rate can fall. It is used to manage the risk associated with a decrease in interest rates. The buyer specifies the rate index, required tenor of the agreement, and the rate level (min. interest rate). Then the seller charges a fee to the buyer for the rate protection. The size of the front-end fee will vary according to the level of the reference rate: the better the protection the more expensive it becomes. Also, the floor rate period and interest rate volatility play significant roles in determining the price.

If market rates fall below the floor level, payments will be made to the buyer to bring the effective rate up the floor level. When market rates exceed the floor, no payments are made and the holder maintains the advantage of higher rates. The instrument is suitable for people holding a floating rate investment.

Figure 8: A Floor Rate Agreement

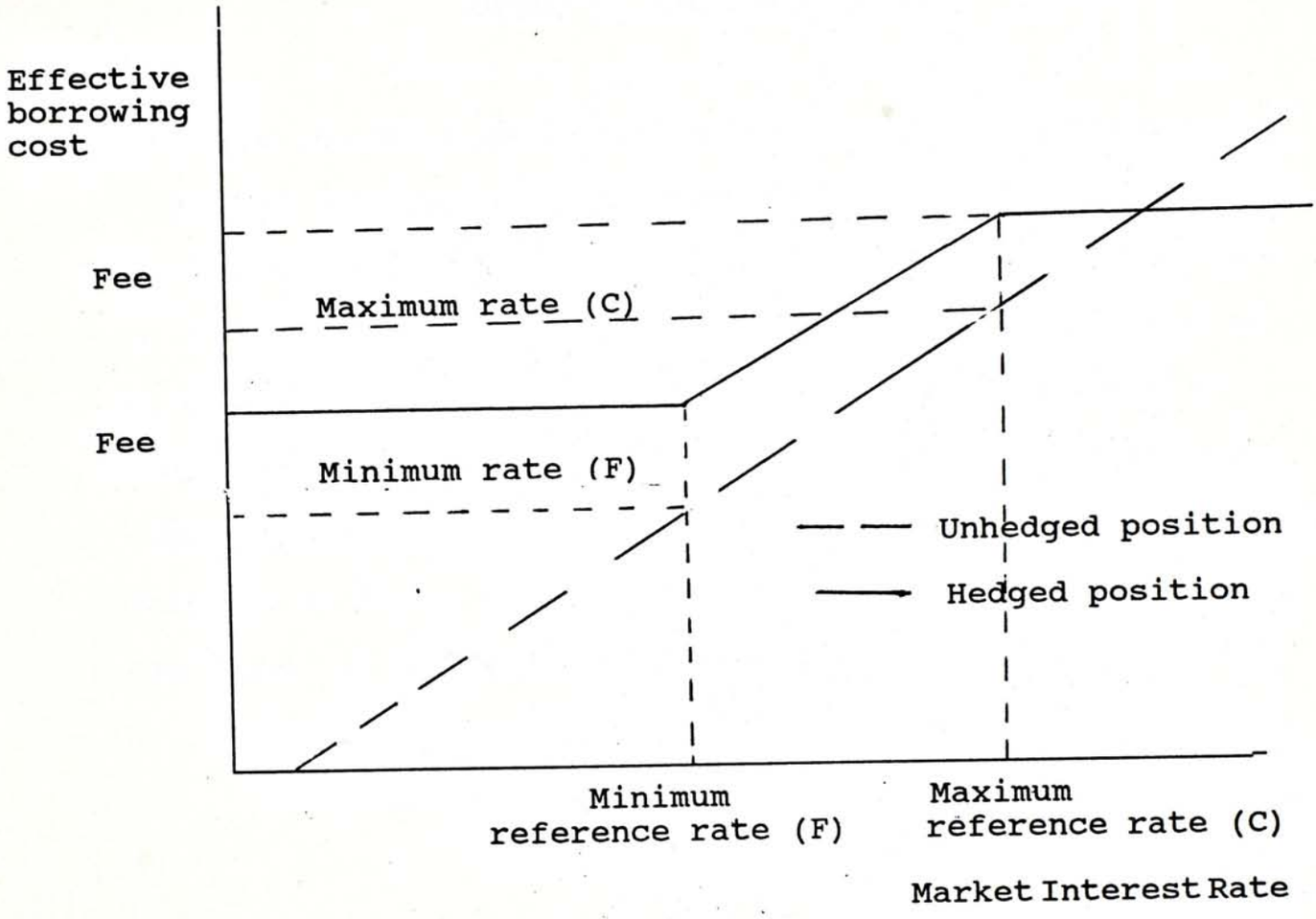


Interest Rate Collar

It is a variation on the cap and floor agreements that draws on elements of both (cap and floor). The seller of the collar agrees to limit the borrower's floating interest rate, but this time to a band limited by a specified cap rate at the high end and by a floor rate at the low end. In this way the borrower

can maintain a floating rate debt instrument with a maximum top rate remains. However, the borrower's potential gain from a decline in interest rate is limited to the rate level of the floor agreement. Fee charged by the seller of a collar is lower than that charged for a cap, reflecting the reduction in the downside benefit to the holder if rates drop. The buyer specifies the rate index and desired tenor of the agreement as for a cap or floor, but also specifies both a maximum and minimum rate. Therefore, the buyer could have his borrowing rate confined to a band or collar. In settlement, only the interest rate differential is exchanged between the seller and the buyer.

Figure 9: A Collar Rate Agreement



Interest Rate Swaptions

The purchase of a swap option gives the corporate the right but not the obligation to enter into a swap on a pre-determined notional principal at some defined future date at a specified strike rate. If exercised, the swaption may be swap settled- that is, the parties actually enter into the swap - or cash settled, in which case the buyer would receive a payment reflecting the intrinsic value of the swap. As with any option purchase,the maximum downside for the buyer is initial premium exposure.

Synthetic Products

1. Asset Swaps

Asset swaps are swaps attached to an asset or portfolio of assets that modify the cash flows, either in terms of coupon, timing, currency, or a blend of any of the above, so that the holder can more accurately tailor his portfolio to his requirements. Asset swaps are attached to cash flows generated by an asset, i.e. cash flows to be

received. Asset swaps can be used to create synthetic floating rate notes off fixed rate bonds with either current, low or zero coupons, or to transform floating rate assets (FRN, floating rate CDs) into a fixed coupon instrument, and they can eliminate funding/liability mismatches and maturity mismatches.

2. Equity Swaps

Equity swaps are effectively a form of OTC futures contract. In an equity-cash swap, counterparty A wishes to forego the return on an equity portfolio over a period in exchange for the return on an equivalently valuable cash deposit over the same period. A second counterparty, the reverse of this position exists. A is said to be "paying" equity and "receiving" cash. B is paying cash and receiving equity.

CHAPTER VIII

HEDGING STRATEGIES

All instruments and strategies discussed below are used to contain and control risk within defined parameters. The examples are mainly from the point of view of a corporate borrower exposed to floating rates.

Strategy 1: Remain Unhedged

The borrower remains completely exposed increases in interest rates but will benefit fully from any decline in rates. He incurs no upfront costs and no counterparty credit risks. He will have no future obligations other than servicing the core debt.

Strategy 2: Interest Rate Swaps

The borrower exchanges the risk of rates increasing for the certainty of a known, fixed rate throughout the life of a swap. However, he also forsakes all the benefit of rates declining.

Strategy 3: Interest Rate Caps

The borrower purchases protection against rates rising above a chosen strike level, while retaining all the benefits of rates declining, unlike a swap.

Strategy 4: Interest Rate Collars

Collars were the next development in the drive to improve hedging mechanisms, allowing the client to retain some of the benefit of declining rates while removing the unpleasantness of paying an upfront option premium for the cap. This unpleasantness can be mitigated, or totally eliminated in the case of a "zero-cost" collar, by the corporate simultaneously selling a floor option of a suitable strike. The foreign exchange equivalent of a collar is the simultaneous purchase of a call and sale of a put on the short currency.

Strategy 5: Interest Rate Swaptions

The liability manager would purchase a payer's swaption, giving him the right to enter a swap in which he

pays the fixed rate and receives the floating. The treasurer would exercise this option if rates had risen above the strike level of the swaption, otherwise he would allow the option to expire and take advantage of the lower rate environment.

Corporates would also sell swaptions. The corporates would sell a receiver;s swaptions, struck at an acceptable fixed rate, giving the purchasing bank the right to receive the fixed rate from the corporate. The bank would exercise this option if rates had declined below the strike rate.

Figure 10: Comparison of Interest Rate Agreements (Borrower)

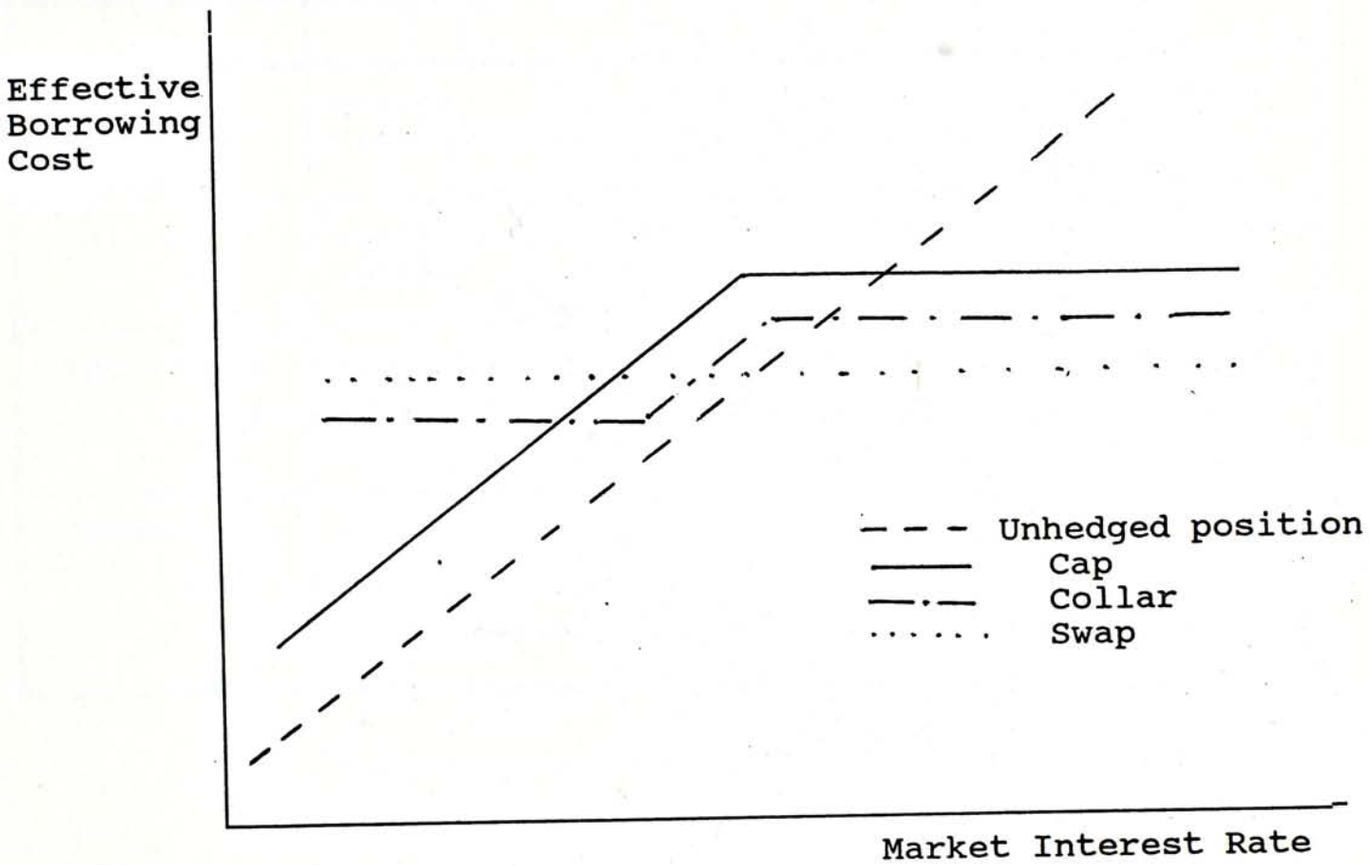


Figure 11: Major Considerations In Interest Rate Risk Management

	A	B	C
Interest Rate Outlook	Fixed/ Floating Rate	Long/Short Maturity or Duration	Lock-in Rate/ Options or Caps
Falling	Assets: Fixed Liabts: Floating	Assets: Long Liabts: Short	Assets: Lock-in
Uncertain	Assets: Floating Liabts: Floating	Assets: Short Liabts: Short	Assets: Cap Liabts: Cap
Increasing	Assets: Floating Liabts: Fixed	Assets: Short Liabts: Long	Liabts: Lock-in

CHAPTER IX

RISK MANAGEMENT IN M.T.R.C AND K.C.R.C.

Mass Transit Railway Corporation

Background

The Mass Transit Railway Corporation of Hong Kong was established for the principal purpose of constructing and operating, on prudent commercial principles, a mass transit railway system having regard to the reasonable requirements of the public transport system of Hong Kong.

In conjunction with railway construction, the Corporation has led in joint venture developments of key residential and commercial properties above stations and depots; manages completed estates; retains commercial exploitation of available assets and skills.

The Corporation is also involved in studies, involving engineering evaluation, financial appraisal and transport planning, on the possible provision of the new railway lines to meet the future public transport requirements of

Hong Kong, for instance, the railway to the New Airport on Lantau Island.

In 1990, 1035 fully paid shares of HK$100,000 each were issued at par for cash to the Financial Secretary Incorporated (the corporate body empowered to hold securities for the Government) to provide finance for the payment of rates. Totally, the shareholder's fund stood at HK$6,544 million. The Corporation's loans and finance leases liabilities remained at HK$18,485 million.

In a period of considerable fluctuation in the international capital markets, MTR's position remained strong in 1990 with the full backing of the Hong Kong Government- a quasi sovereign entity. Ratings from recognised agencies such as Moody's (A3/Aa2) remained unchanged. The Corporation has an ongoing need for substantial financing principally refinance maturing debt and the corporation intend and anticipate issuing in local and overseas markets to continue when conditions are suitable (see Table 3). The Corporation successfully arranged HK$2,651 million facilities and HK$3,566 million swap transactions in 1990.

Financial Strategy

The financial strategy of Mass Transit Railway Corporation is " On existing and additional assets to plan, justify and obtain sufficient revenue over time from customers to cover costs incurred in providing the service and in maintaining and improving the assets; to secure, service and retire an appropriate level of debt and to reward the shareholder at a level commensurate with his risk and expectations."[1]

Debt Management

In managing its large amount of debt, HK$13,576 million in 1990, Mass Transit Railway Corporation takes on a prudent approach. Each year the corporation will revise a preferred financial model based on the forecast of the future financing needs and movements of the interest rates. Treasury Department is responsible for the funding. During 1990, HK$2.7 billion in facilities were arranged to meet the corporation's requirements including that for a forward

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[1]. Mass Transit Railway Corporation, Annual Report, 1990

financing horizon. These included a third public issue in Japan- a 5-year Yen 10 billion bond, an 8-year dual currency US$93 million and HK$744 million transferable loan and a 5-year US$90 million transferable loan syndicated at the end of the year as well as some private direct financing. The Treasury Department is being treated as a cost centre. They are responsible for meeting the funding requirement at the minimum possible cost. They are not responsible for making any profit nor are their staff evaluated in terms of profits attained or losses sustained. As mentioned before, the core business of M.T.R.C. is in the provision of transport to the public and it is a hundred percentage owned company by the Hong Kong Government, therefore, it is subject to a stringent control by the Government. For every fundamental change in policy including the financial strategy needs Board's approval. It is comparatively difficult to convince the Board or the Government to take on more risk in return for higher return. For interest rate management, the corporation draws a line between fixed rate and floating rate (mainly HIBOR) roughly into two equal parts. The portion will vary according to the forecast of the future interest rate movement. In the interest rate forecast, the treasury department draws on individual expertise and judgement to

a very great extent. In 1990, the interest and finance charges totalled at HK$1,578 million. A total of HK$3.6 billion in swaps were arranged for the currency and interest rate management purposes.

Techniques Employed

As mentioned in the previous section, the corporation is bounded to employ instrument of lower cost and risk (or time to monitor). The corporation mainly makes use of Swaps to hedge its position or uses fixed rate instruments to lock-in its commitment. The main reasons for choosing Swaps as the instrument are that the market of Swaps has been undergoing considerable development for the past few years. As the activities of the market are very strong, it is comparatively easier for the M.T.R.C. to find the right counterparty for its large amount of funding requirement. Moreover, swap does not involve any balance sheet exposure. These kinds of off-balance sheet transactions will not jeopardise the financial position of the corporation to the bankers. Therefore, the balance sheet cost will not be affected. As a result, it saves M.T.R. about 25 basis point in the normal financial charge. In order to meeting

its low cost funding requirement, the corporation has an open mind on the sources of fund wherever the cost is the lowest, for example, Japan. However, this kind of multi-sourcing approach exposes the corporation to another kind of risk, i.e. currency risk. In order to cover this kind of risk, the corporation will arrange a currency swap to convert those currencies into US dollars or HK dollars whichever is available.

As most of the M.T.R.'s debts cover longer than 5 years, therefore, Forward Rate Agreements is not a suitable candidate to M:T.R. as F.R.A.s usually last for less than 1 year. Moreover, as far as Hong Kong is concerned, Options market is not yet available.

In a word, the method adopted by M.T.R.C. in managing interest rate risk is quite different from those mentioned in the previous paragraph. First of all, the main revenue of M.T.R. comes from the commuters' fares and estate development. They are predictable and stable. Treasury function serves as a supportive centre. The role of treasury as a profit center is deemphasised. Secondly, the corporation does not possess of any kind of interest rate sensitive assets, just the liabilities. Therefore, it

simplifies the complexities of interest rate risk management. The only thing left is debt management. With regards to the risk identification process, M.T.R. employs neither of the three approaches commonly practised by other financial institutions.

As M.T.R. is a publicly funded corporation, it is not justifiable for the corporation to take on unnecessary risk in active risk management. Therefore, most of the funding is in the form of fixed interest rate borrowing.

Based on the previous discussions, the corporation chooses its strategy in managing the interest rate risk by means of swaps to hedge its interest rate commitment and to retire the issued bonds or instrument from time to time whenever the situation is favourable.

Kowloon-Canton Railway Corporation (K.C.R.)

Principal Activities

The principal activities of the corporation are the operation of a railway system between Kowloon and Lo Wu; operation of international passenger and freight traffic in

association with the Chinese railway authority; construction and subsequent operation of the Western New Territories light rail transit system; development of associated commercial activities, including the sale of advertising, marketing of concessions and property leasing; development of property and operation of bus services.

Financial Management

Like the M.T.R., K.C.R.'s revenue mainly comes from its core business. In 1990, the revenue is HK$625 million compared with HK$3,164 million of M.T.R. With the improvement in operating profit, the corporation's long term debt dropped from HK$915 million in 1989 to HK$824 million in 1990.

The treasury function of K.C.R. is being treated as a supportive function. A cost center approach is being employed. Treasurer is responsible for raising the necessary fund for the corporation's need. One characteristic of the K.C.R. is that exposure in interest rate risk only applies in the liabilities it incurred. However, given the comparatively small amount of requirement, the corporation mainly makes use of the local

capital market such as bonds and certificates of deposits. To hedge against interest rate fluctuations, swaps are also used to lock-in the interest rate payment. The interest rate payment is then budgeted accordingly. The reasons for choosing swaps have already discussed in the M.T.R.'s section.

CHAPTER X

CONCLUDING REMARKS

From the previous sections' discussions, we can find substantial difference in managing interest rate risk between financial institutions such as banks and publicly funded utility companies in Hong Kong. The attitude toward interest rate risk management in publicly funded utility companies is quite different from the banks, financial institutions or corporations with assets and liabilities sensitive to the interest rate movements. This is mainly explained by the unique feature of the companies as a quasi-government organisation and the difference in the incomes and liabilities sources.

To reflect their conservative attitude in managing financial risk, treasury department is being treated as a cost center rather than a profit center or investment center. Therefore, they tend to adopt strategy to minimize most of the risks.

As the management process is comparatively less complex. Identification of interest rate risk is less troublesome.

As a result, less sophisticated techniques are being employed.

In executing its interest rate risk management program, treasury department tends to use personal judgemental approach. With the cost center approach and treatment, treasurers take on a conservative approach in the treatment of interest rate risk. As swap can fulfil the particular requirement of the "corporations", treasurers are more than happy to choose swap as their interest rate risk management tool.

From the above analysis, we can conclude that attitude or support of the top management towards interest rate risk management can affect the styles or methods used in interest rate risk management. A profit center will predict a more aggressive approach in the management.

APPENDICES

APPENDIX I

Selected Financial Information of M.T.R.C.

(A) Revenue in $ Million

1990	1989
3,164	2,734

(B) Interest and Finance Charges in $ Million

	1990	1989
Interest expenses in respect of:		
Bank loans, overdrafts, and other wholly repayable within 5 years	1,438	1,359
Other loans not wholly repayable within 5 years	37	196
Obligations under finance leases	111	52
Interest income in respect of: Investment by fund managers	(17)	-
Deposits with financial institutions	(4)	(7)
Finance charges	16	13
Exchange gain	(3)	(25)
	1,578	1,588

(C) Debt Profile

	1990	1989
Fixed Rate	58%	42%
Floating Rate(HIBOR/LIBOR)	50%	50%

APPENDIX II

Selected Financial Information of K.C.R.C.

(A) Revenue in $ Million

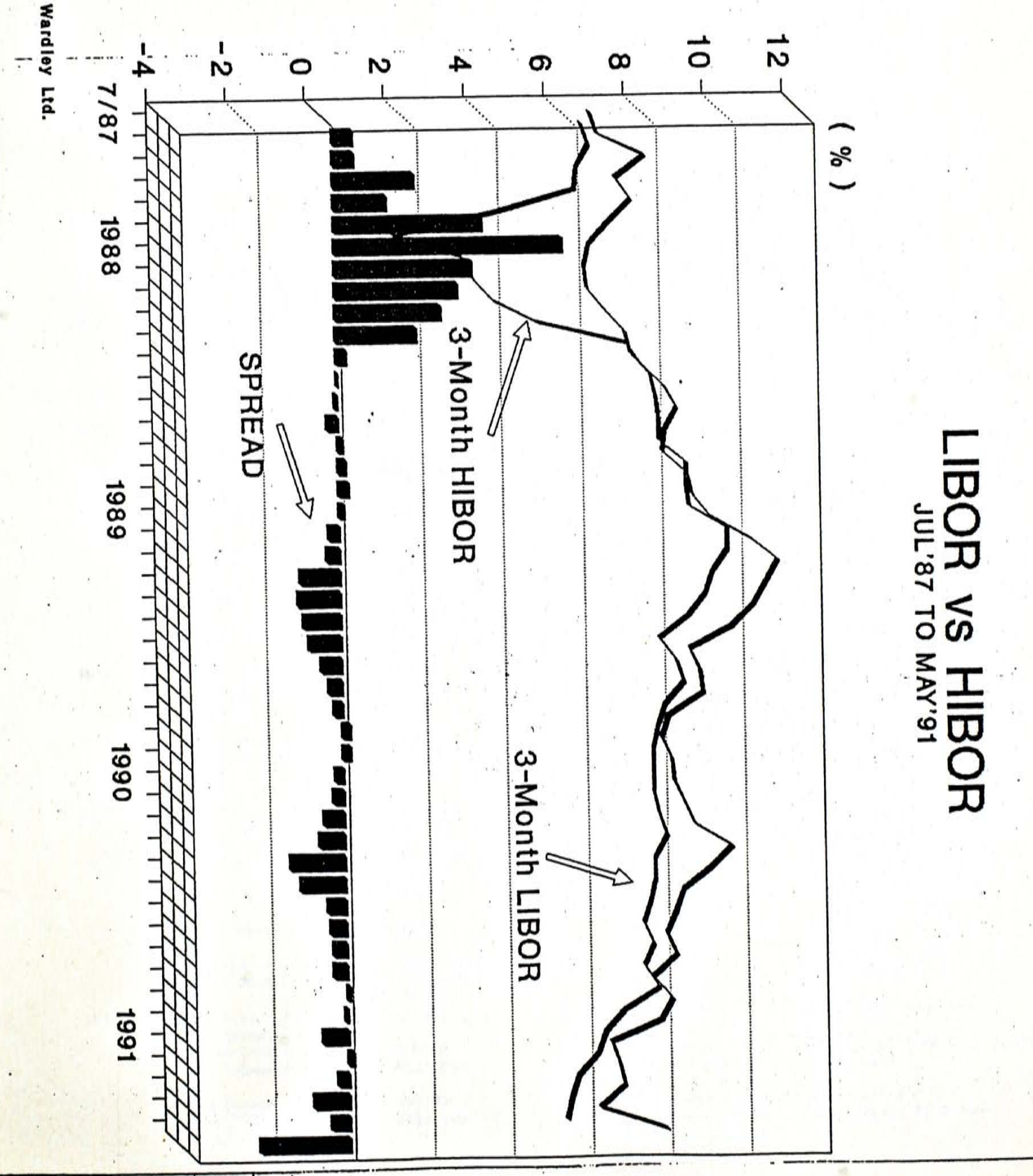
1990	1989
1,591	1,359

(B) Long Term Debt in $ Million

	1990	1989
Bearer Participation Certificates	500	500
Bills of Exchange	-	100
Banks and other loans	324	315
	824	915

APPENDIX III

INTEREST RATE



APPENDIX IV

CAPITAL MARKET INSTRUMENTS EMPLOYED BY MTRC

Capital Market Instruments Employed by MTRC

Year	Facilities	Amount (M)	Term (Yrs)	A/Manager(s)	Significance
1976	Fixed Rate Bond	HK$400	10	Wardley	Government Guaranteed, SLA status
1978	Guaranteed Note	HK$206.75	5	Direct Issue	Tender conducted by MTRC, Government Guaranteed SLA status
1979	Accommodation Bill	HK$500	3	Wardley	Low cost facility
1982	HK$ Commercial Paper	HK$200	3	Wardley	First in Hong Kong
1983	US$ Banker's Acceptance	US$13	Annual renewal	Citibank	Low cost facility
1984	US$ Commercial Paper	US$100	3	Barclays/Goldman Sachs	First Hong Kong issuer
	TLC Loan	HK$500	5	Citicorp	First Hong Kong issuer
	HK$ FRN	HK$500	8	Morgan Guaranty	Sold by tender; First Hong Kong Corp to issue FRN
	US$ FRN	US$75	10	Morgan Guaranty	First Hong Kong Corp to issue US$ FRN
	HK$ Commercial Paper	US$800	3	Schroders	Tender conducted by MTRC
1985	HK$ Fixed Rate Exchangeable Bond	HK$500	8	Morgan/Chase/ Wardley	First Hong Kong issuer
	ECU Bond	ECU50	5.5	Paribas	Swapped into HK$; First Hong Kong issuer
	HK$ Commercial Paper	HK$800	5	Wardley	Tender conducted by MTRC
	Syndicated Loan with TLC	HK$2,000	10	Wardley/Sanwa	Loan with securised feature
1986	HK$ FRN with Mini-Max	HK$1,100	7	ManHan	First Hong Kong issuer
	Eurocommercial Paper with Euroyen option	US$100	7	Merrill Lynch/ Morgan/Warburg	First Hong Kong Corp issuer (A1/P1 rated in Feb 1987)
	Yen Denominated Bond	YEN10,000	7	Sanwa	Swapped into HK$; First Hong Kong Corp to issue Yen Bond
	Bull/FRN ("FIRST)	HK$750	5	Lloyds/ManHan	Synthetic fixed rate; First Hong Kong issuer
	HK$ Commercial Paper	HK$500	1	Schroders	Non-underwritten facility; Low cost
	US$ FRN with Warrants for Bull FRN	US$85 plus HK$663	5	Paribas	Swapped into HK$ to form synthetic fixed rate
1987	HK$ Alternative Interest Rate Bond	HK$500	5	Paribas	First Hong Kong issuer
	Multi-Currency Note	AUD100	2	BT Asia	First Hong Kong Corp issuer
	HK$ Commercial Paper	HK$2,500	5	Schroders/ Wardley	A1/P1 Rated
	US$ Commercial Paper	US$100	3	Goldman Sachs	A1/PI Rated
	Syndicated Loan with TLC	HK$2,500	8	Chemical/ManHan	The largest Syndicate

Interest Rate Risk Management

1988	HK$ Bond	HK$200	7	Wardley	Step-up mode of interest rate
	YEN Bond	YEN10,000	7	Nomura	Swapped into HK$, First Hong Kong Corp to list in Tokyo, Rated AA-
	CAN Bond	CAD100	3	Citicorp	Swapped into US$ and HK$; First Hong Kong Corp to issue Euro Canadian Bonds
	Syndicated Loan with TLC	HK$400	15	Paribas	Cost effective Maturity beyond 1997
	Synidcated Loan with TLC Variable Margin	HK$540	14.5	Citicorp	Longest maturity for the Corporation - 2006
	Medium Term Notes	HK$3,000	7	Morgan	First Hong Kong Issuer, Low interest margin and commitment fee
1989	YEN Bond	YEN10,000	5	Yamaichi	Swapped into HK$, Rated AA
1990	Yen Bond	YEN10,000	5	Yamaichi	Swapped into HK$, Rated AA
	Syndicated Loan with TLC	HK$744/ US$93	8	Paribas	Dual Currency Loan
1991	Syndicated Loan with TLC	US$90	5	Societe Generale	US$ Loan with floor
	US$ FRN with Warrants for HK$ Bonds	US$100	5	Paribas	East Meets West Issue with floor
	YEN Bond	YEN5,000	7	LTCB	Swapped into HK$
	Syndicated Loan with TLC	HK$1,200	5.5	Wardley	-

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